



Mark Up Copy of Amendments to Claims

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Claim 74 has been amended as follows:

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74. (Amended) A method for sequencing DNA which comprises:

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(a) treating the DNA with a mixture comprising an oligonucleotide primer, a DNA polymerase, four different deoxynucleotides, and four different labeled dideoxynucleotides, under conditions permitting a deoxynucleotide or a labeled dideoxynucleotide or both to be incorporated into a DNA sequencing fragment, wherein each different deoxynucleotide and each different labeled dideoxynucleotide is complementary to one of the four nucleotides present in the DNA, wherein each labeled dideoxynucleotide comprises a chemical moiety attached via a linker to the dideoxynucleotide; and wherein each of the four different labeled dideoxynucleotides has a molecular weight which can be distinguished from the molecular weight of the other three labeled dideoxynucleotides using mass spectrometry;

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(b) generating a plurality of DNA sequencing fragments having different lengths that are terminated with the labeled dideoxynucleotides so as to generate a plurality of different labeled DNA sequencing fragments, wherein each DNA sequencing fragment has a 3' end and the chemical moiety is attached via the linker to the 3' end of the DNA sequencing fragment;

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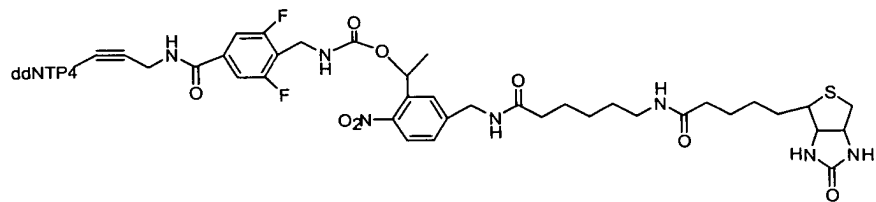
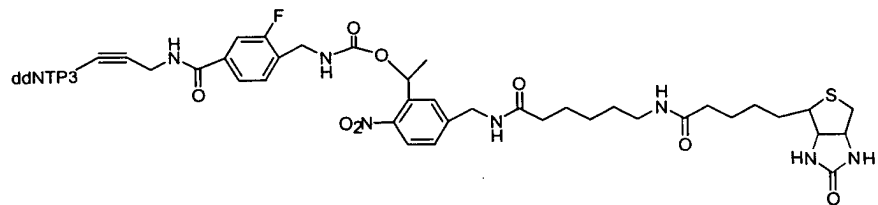
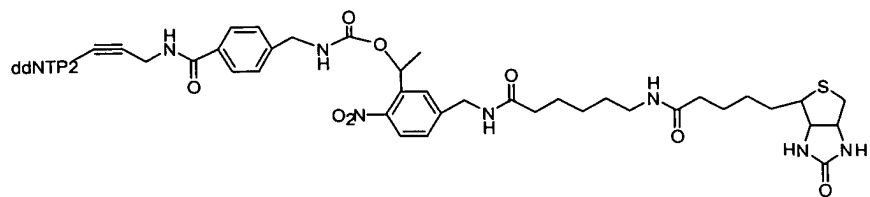
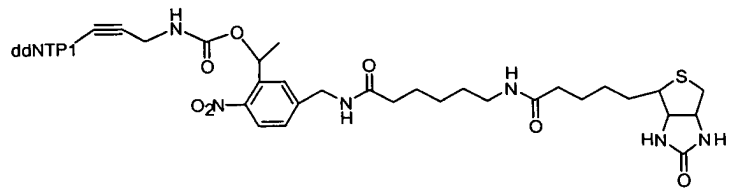
(c) contacting the labeled DNA sequencing fragments with a surface coated with a

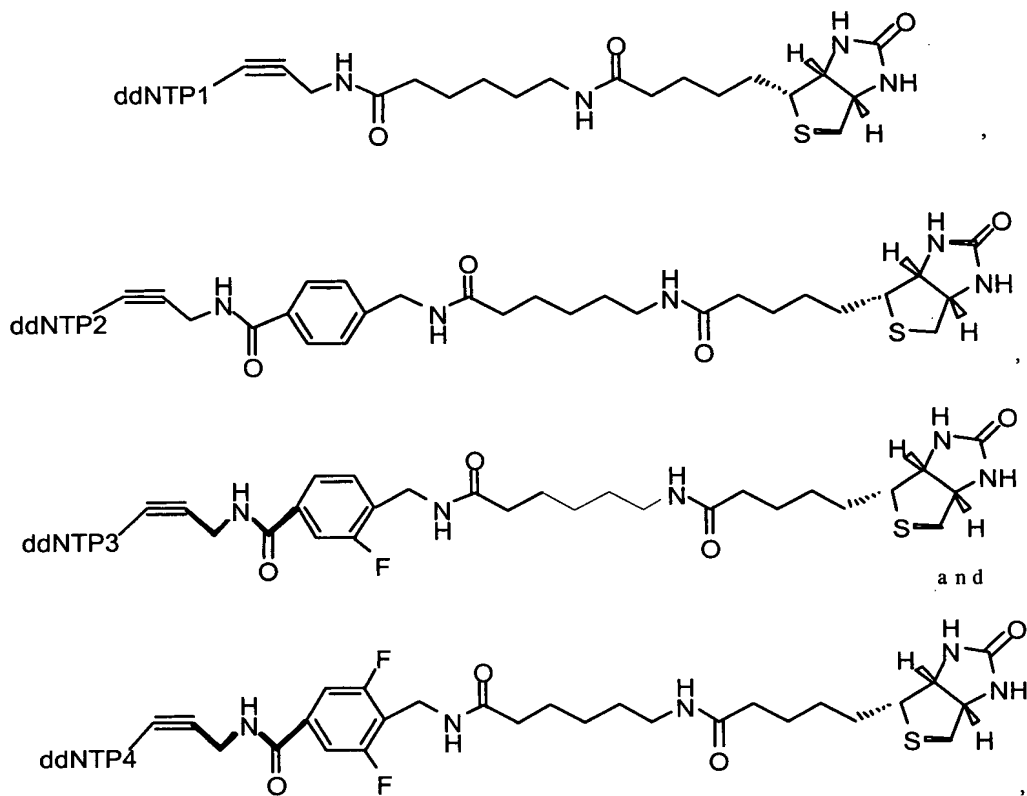
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compound that specifically interacts with the chemical moiety attached via the linker to the 3' end of the DNA sequencing fragments, thereby capturing the labeled DNA sequencing fragments on the surface[;], wherein the contacting is performed in a system comprising (i) a channel whose surface is coated with a compound that specifically interacts with the chemical moiety, wherein the channel comprises a plurality of ends, (ii) a plurality of wells each suitable for holding a sample, (iii) a connection between each end of the channel and a well, and (iv) a means for moving the sample through the channel between wells;

- (d) washing the surface to remove non-bound components;
- (e) treating the labeled DNA sequencing fragments so as to release the labeled DNA sequencing fragments from the surface; and
- (f) determining the difference in molecular weight between different labeled DNA sequencing fragments which are represented as adjacent peaks on a mass spectra of the labeled DNA sequencing fragments produced using mass spectrometry, so as to sequence the DNA;

wherein either (i) the labeled dideoxynucleotides are biotinylated dideoxynucleotides selected from the group consisting of

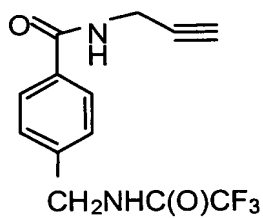




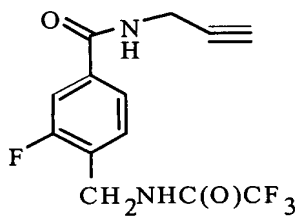
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where ddNTP1, ddNTP2, ddNTP3, and ddNTP4 represent four different dideoxynucleotides; or

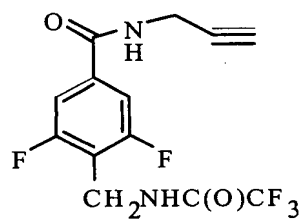
(ii) the linker is selected from the group consisting of



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and



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